

Amendments to the Claims

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1. (Currently Amended) A method of scheduling data for
2 transmission over a communication link based on priorities assigned to the data,
comprising:
4 receiving multiple descriptors at a communication interface device, each of said
descriptors describing a data portion having an associated priority;
6 storing said descriptors in a plurality of memories on said communication
interface device, wherein each of said memories is configured to store one or more of
8 said descriptors describing data associated with a predetermined priority;
maintaining a dynamic weight for each of said plurality of memories, wherein
10 each said dynamic weight corresponds to a threshold amount of data associated with said
predetermined priority; and
12 servicing said plurality of memories, wherein each said servicing of one of said
plurality of memories comprises:
14 (a) receiving a descriptor from said serviced memory;
(b) retrieving data described by said received descriptor;
16 (c) scheduling said data for transmission via the communication link;
(d) determining whether an amount of data scheduled during said servicing
18 for transmission via said communication link exceeds said threshold amount of
data corresponding to said dynamic weight for said serviced memory; and
20 (e) repeating states (a) through (d) for a next descriptor in said serviced
memory if said amount of data scheduled for transmission during said servicing is
22 less than said threshold amount of data; and
(f) if said amount of data scheduled for transmission exceeds said threshold
24 amount of data, decreasing said threshold for a next servicing of said serviced
memory.

2. (Currently Amended) The method of claim 1, wherein said servicing
2 further comprises:
(gf) determining if said serviced memory contains a descriptor.

3. (Currently Amended) The method of claim 1, wherein said servicing
2 further comprises:

(gf) determining whether a dynamic weight for one of said plurality of
4 memories has changed.

4. (Cancelled)

5. (Currently Amended) The method of claim 1 4, further
2 comprising:

if any of said dynamic weights changes prior to said next servicing, reinstating the
4 pre-decreased threshold for said next servicing.

6. (Original) The method of claim 1, wherein said receiving multiple
2 descriptors comprises:

determining if a first memory of said plurality of memories contains less than a
4 predetermined number of descriptors, wherein said first memory is configured to store
one or more descriptors describing data associated with a first priority;

6 issuing a request to a host computer, said request identifying said first memory;
receiving a first descriptor describing a first set of data having said first priority.

7. (Original) The method of claim 6, wherein said first descriptor
2 comprises one or more of:

an identifier of a storage area on said host computer containing said first set of
4 data;

an indicator configured to indicate whether said first set of data is a starting
6 portion of data for a packet; and

an indicator configured to indicate whether said first set of data is an ending
8 portion of data for a packet.

8. (Original) The method of claim 1, further comprising transmitting

2 said data scheduled for transmission via said communication link before the entire
contents of a packet comprising said scheduled data are scheduled for transmission.

9. (Original) The method of claim 1, wherein each of said dynamic
2 weights is dynamically modifiable to adjust said threshold amounts of data.

10. (Original) The method of claim 1, wherein the communication
2 interface device is a network interface circuit and the communication link is a network.

11. (Currently Amended) A method of scheduling data for
2 transmission over a communication link by servicing, in turn, multiple memories
associated with data having different priorities, comprising:

4 storing in a first memory a first set of descriptors associated with data having a
first priority, wherein said first memory has a first dynamic weight corresponding to a
6 first threshold amount of data;

8 storing in a second memory a second set of descriptors associated with data
having a second priority, wherein said second memory has a second dynamic weight
corresponding to a second threshold amount of data; and

10 in a first servicing turn of said first memory:

12 determining whether one of said first weight and said second weight has
changed;

receiving a first descriptor from said first memory;

14 parsing said first descriptor to identify a first data portion having said first
priority;

16 retrieving said first data portion from a host computer memory;

scheduling said first data portion for transmission onto the communication
18 link; and

determining whether an amount of first priority data exceeding said first
20 threshold has, during said first servicing turn, been scheduled for transmission;
and

22 if said first threshold has been exceeded, maintaining a first deficit to determine

24 how much less than said first threshold of data may be scheduled during a subsequent servicing turn of said first memory, wherein said first deficit is initially proportional to said excess.

2 12. (Currently Amended) The method of claim 11, further comprising, if said amount of first priority data scheduled for transmission during said first servicing turn exceeds said first threshold: decreasing said first threshold for a subsequent servicing
4 of said first memory wherein said first servicing turn further comprises: determining whether one of said first weight and said second weight has changed.

2 13. (Currently Amended) The method of claim 11 ~~12~~, wherein said first deficit is set to zero if one of said first weight and said second weight has changed.

2 14. (Original) The method of claim 11, wherein said first servicing turn further comprises: determining whether said first memory is empty.

2 15. (Original) The method of claim 14, wherein said first servicing turn is terminated if, during said first servicing turn, either said first memory is determined to be empty or said amount of first priority data scheduled for transmission exceeds said first
4 threshold.

2 16. (Original) The method of claim 11, wherein said determining comprises:
4 incrementing a data counter for each unit of first priority data scheduled during said first servicing turn; and
comparing said data counter to said first threshold.

17. (Original) The method of claim 16, wherein said data unit is a byte.

2 18. (Original) The method of claim 11, further comprising servicing said second memory in a second turn, wherein said servicing said second memory comprises:

until at least one of:

4 said second memory is determined to be empty;

 one of said first weight and said second weight change; and

6 an amount of data scheduled during said second turn for transmission over
the communication link exceeds the lesser of said second threshold and said
8 second threshold minus a second deficit, wherein said second deficit corresponds
to an amount of data by which said second threshold was exceeded in one or more
10 earlier servicing turns of said second memory;

repeatedly:

12 receiving from said second memory a second descriptor describing a
second set of data having said second priority;

14 retrieving said second set of data;

a2 scheduling said second set of data for transmission via the communication
16 link; and

 tracking an amount of data scheduled during said second turn by adding
18 the size of said second set of data to a measure of data previously scheduled
during said second turn.

19. (Original) The method of claim 18, wherein:

2 said first memory corresponds to data having a highest priority; and

 if one of said first servicing turn and said second servicing turn terminates

4 because one of said first dynamic weight and said second dynamic weight change, said
first memory is the next memory serviced.

20. (Original) The method of claim 11, wherein the method is performed
2 in a network interface circuit and the communication link is a network.

21. (Original) The method of claim 11, wherein said first dynamic weight
2 is approximately equal to a maximum packet size of the communication link.

22. (Original) The method of claim 11, wherein said second dynamic

2 weight is approximately equal to one.

23. (Cancelled)

24. (Currently Amended) A computer readable storage medium

2 storing instructions that, when executed by a computer, cause the computer to perform a
method of scheduling data for transmission over a communication link by servicing, in
4 turn, multiple memories associated with data having different priorities, the method
comprising:

6 storing in a first memory a first set of descriptors associated with data having a
first priority, wherein said first memory has a first dynamic weight corresponding to a
8 first threshold amount of data;

10 storing in a second memory a second set of descriptors associated with data
having a second priority, wherein said second memory has a second dynamic weight
corresponding to a second threshold amount of data; and

12 in a first servicing turn of said first memory:

determining whether one of said first weight and said second weight has

14 changed;

receiving a first descriptor from said first memory;

16 parsing said first descriptor to identify a first data portion having said first
priority;

18 retrieving said first data portion from a host computer memory;

20 scheduling said first data portion for transmission onto the communication
link; and

22 determining whether an amount of first priority data exceeding said first
threshold has, during said first servicing turn, been scheduled for transmission;
and

24 if said first threshold has been exceeded, maintaining a first deficit to determine
how much less than said first threshold of data may be scheduled during a subsequent
26 servicing turn of said first memory, wherein said first deficit is initially proportional to
said excess.

25. (Original) A communication interface device for transmitting
2 prioritized data over a communication link, comprising:
a first memory configured to store a descriptor corresponding to a first packet
4 having a first priority, said first memory being associated with a first weight, wherein
said first weight corresponds to a first preferred amount of data to be scheduled, during a
6 first servicing turn of said first memory, for transmission over a communication link;
a second memory configured to store a descriptor corresponding to a second
8 packet having a second priority, said second memory being associated with a second
weight, wherein said second weight corresponds to a second preferred amount of data to
10 be scheduled, during a first servicing turn of said second memory, for transmission over
said communication link;
12 a transmission queue into which one of said first packet and said second packet is
placed for transmission over a communication link; and
14 an arbiter configured to monitor an amount of data retrieved during said servicing
turn in which one of said first packet and said second packet is placed in said
16 transmission queue;
wherein said first weight and said second weight are dynamically adjustable.

26. (Original) The communication interface device of claim 25, further
2 comprising a loader configured to retrieve said first packet for placing in said
transmission queue during said servicing turn of said first memory.

27. (Original) The communication interface device of claim 26, wherein
2 said loader is further configured to load a next descriptor for storage in one of said first
memory and said second memory.

28. (Original) The communication interface device of claim 25, wherein
2 said arbiter is further configured to determine whether an amount of data placed in said
transmission queue during said first servicing turn of said first memory exceeds said first
4 preferred amount of data to be placed in said transmission queue during said first

servicing turn of said first memory.

29. (Original) The communication interface device of claim 28, wherein
2 said first preferred amount of data is reduced by a deficit for a second servicing round of
said first memory.

30. (Currently Amended) The communication interface device of
2 claim 29 28, wherein said deficit corresponds to an amount of data, beyond said first
preferred amount of data, that is placed in said transmission queue during said first
4 servicing turn.

a2 31. (Original) The communication interface device of claim 26, further
2 comprising a multiplexer configured to pass said descriptor corresponding to said first
packet to said arbiter and said loader during said first servicing turn of one of said first
4 memory and said second memory.

32. (New) A method of scheduling data for transmission over a
2 communication link based on priorities assigned to the data, comprising:
receiving multiple descriptors at a communication interface device, each of said
4 descriptors describing a data portion having an associated priority;
storing said descriptors in a plurality of memories on said communication
6 interface device, wherein each of said memories is configured to store one or more of
said descriptors describing data associated with a predetermined priority;
8 maintaining a dynamic weight for each of said plurality of memories, wherein
each said dynamic weight corresponds to a threshold amount of data associated with said
10 predetermined priority; and
servicing said plurality of memories, wherein each said servicing of one of said
12 plurality of memories comprises:
(a) receiving a descriptor from said serviced memory;
14 (b) retrieving data described by said received descriptor;
(c) scheduling said data for transmission via the communication link;

- 16 (d) determining whether an amount of data scheduled during said servicing
for transmission via said communication link exceeds said threshold amount of
18 data corresponding to said dynamic weight for said serviced memory;
- (e) repeating states (a) through (d) for a next descriptor in said serviced
20 memory if said amount of data scheduled for transmission during said servicing is
less than said threshold amount of data; and
- 22 (f) if said amount of data scheduled for transmission exceeds said threshold
amount of data, decreasing said threshold for a next servicing of said serviced
24 memory.
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